

Final draft

THE TEACHING OF SERVICE COURSES IN FOREST ENTOMOLOGY

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The objective of service courses in forest entomology is to help in preparing professional foresters by providing forestry students with information they will be able to use in later practice of the profession of forestry. How that information is provided and the type of instruction that is given is of paramount importance in determining the degree of success attained in reaching that objective. The background, training, experience, and viewpoint of the instructor is and always has been critical in determining the quality of his instruction. Relatively few entomologists have sufficient interest in forest entomology and sufficient experience or training in forestry to teach an outstanding course in forest entomology. That may be the reason why forest entomology may become merely another course to be assigned to some faculty member in the division of entomology. However, the problem of obtaining instructors who have the breadth of experience and training, or the interest, is not the only one which must be solved. In addition, forest entomology must compete for time in well-filled forest school curricula.

One of the serious problems facing the forest schools today is that, if the broad field of work known as forestry is to be covered, the forest school curriculum has to be filled with a variety of courses on a variety of subjects. Many faculty members agree that such special phases of forestry as range management, pulp and paper manufacture, forest recreation, wildlife management, and others must be taught in addition to the five standard fields of forestry, namely, economics, management, silviculture, protection, and utilization. The problem forest-school faculties have to solve is how to cover all those subjects and at the same time offer adequate instruction in the background, basic, or fundamental courses that are an integral part of a good college education. This problem affects the teaching of forest entomology because crowded curricula limit the time that can be allotted to that subject.

Suggested solutions to the problem have been (1) limit instruction in professional forestry to the graduate school; (2) introduce a required 5-year course of study in schools of forestry; (3) make a clear distinction between the training of forest practitioners and forest specialists (Schmitz 1932), requiring the specialists to take graduate work in their special fields of interest; (4) confine professional forestry training to the five fields of forestry, strictly defined, and let other phases in the broad field of wild-land conservation develop its own professions and professional standards (Chapman 1937); (5) provide technical courses in forestry and in those specialized fields of conservation which are the more closely related to forestry.

Sound arguments have been presented in defense of each one of the above suggestions. What eventually will be done in solving this problem will determine what specialized fields of entomology should be taught as forest entomology. For example, the insect problems of browse and grasslands should be covered in detail if grazing management is considered a standard basic subject in the study of forestry. The special insect-control problems concerned in the protection of recreational areas should be discussed if forest recreation is a standard subject in the field of forestry. Insects attacking wildlife should be covered in forest entomology if studies in wildlife management become a part of the training of a forester.

Lacking the ability to forecast where current trends in forest-school education are leading, I can merely fit my discussion of the teaching of forest entomology to a certain, more or less standard conception of the field of work covered by the term "forestry." What courses should be taught? What subject matter should be covered? How may forest entomology best be correlated with forest-school curricula? The ideas I shall express are merely my own opinions. I trust that some of you will hold other convictions so that we may enjoy a full discussion of the subject.

The objective is to fit adequate instruction in forest entomology to a standard curriculum in forestry. Such a curriculum would consist of basic background or preparatory courses, a certain amount of intermediate or pre-technical instruction, and later technical work in silviculture, forest protection, forest management, forest utilization, and forest economics (Graves and Guise 1932). The undergraduate course would take 4 years and would be considered sufficient to provide the student with information necessary to meet the ordinary demands of a professional practice in forestry.

In such a curriculum forest entomology naturally fits into the field of forest protection. A technical course is called for that will give the facts, illustrate and discuss the important forest pests, and show how they affect the five fields of forestry. A technical course of that type is recommended by the foresters themselves as being a necessary part of a training in forestry. Although Fernow (1909) took the stand that a mere modicum of knowledge of forest entomology was necessary, many others have recommended what can be considered as a 3-hour-per-week, one-semester course in technical forest entomology (Baker 1909, Committee of the Conference of Forest Schools 1912, Second National Conference on Forest Education 1922, Graves and Guise 1932, and Chapman 1937).

This course should fix in the student's mind that insects are a fundamental part of forest biology and should show how they affect the natural development of forests and man's plans for the management and utilization of forest resources. The impacts and interrelations of forest insects and silviculture, management, economics, and utilization should be brought out, and the principles of control should be discussed at length. Laboratory or field exercises in studying the diagnostics of infestations and the work of forest-insect species are a necessary part of such a technical course in forest entomology.

I do not think it desirable that details of habits, biologies, and methods of control for a long list of forest-insect species in American forests be given in the classroom. That information can and should be furnished the student as supplementary material or in textbooks. It seems much more to the point to make a careful but adequate selection of species to illustrate variations in types of life histories, damage, control methods, regional problems, or differences in the problems of native versus introduced species. Emphasis in such a technical course should always be placed on the relations of forest entomology to other phases of forestry, the principles underlying the selection and use of control methods, and the careful consideration of a relatively short list of good illustrations. The approach should be ecological, with forest insects interpreted as a part of the forest biology.

However, courses such as the above require groundwork and preparation. As a rule foresters have not been prepared by pretechnical or preparatory courses to understand much about the zoological sciences. Common zoological terms used in the forest entomology course may mean nothing to the students. Taxonomy, anatomy, physiology, metamorphosis, insect ecology, in fact knowledge of any of the fundamental phases of entomology, may be lacking to the extent that the students will have difficulty in understanding the material given in the technical course in forest entomology.

In most cases the problem of providing adequate groundwork instruction in entomology has been solved by having that groundwork given as a part of the course in technical forest entomology. However, I doubt if justice can be done either to the general preparatory instruction or to the advanced instruction under such an arrangement. If nothing better can be arranged it may be necessary to give but one course, but, to my mind, two courses, one in general entomology and the other in forest entomology, are necessary to give adequate instruction in entomology to students of forestry.

If a general introductory or pretechnical course is possible, its value would depend to a considerable extent on the way it was taught and in the interest it aroused. In that respect I would be partial to a course given and planned primarily for students in several related sciences or professions. I like the type of presentation described by Stewart (1929) in which the course is planned to present the fundamentals of entomology in ways calculated to foster an intelligent student interest because the objective has been to breathe life into the subject by teaching it as something affecting our everyday living.

But the complaint of the forest-school faculties is that the curriculum already is too full. It may be impossible to get the time for two courses. Fundamentals in entomology will have to be taught. If but one course is given they will have to be taught in that course. Forest entomology also will have to be taught in that same course if no other provision is made. There is not time to do both things well. However, if arrangements can be made, there may be a way in which more time can be made available to the teacher of forest entomology. At the same time it seems possible to do a better job of teaching because the relations of forest entomology and forestry would be emphasized instead of suppressed as is the case when the course in forest entomology is separated by artificial course boundaries from the forestry instruction.

The suggestion is close cooperation between the instructor in forest entomology and the instructors in forestry subjects. Wherever possible have set aside from one to several lectures in the forestry courses. Make those available to the instructor in forest entomology to bring out the relations of forest entomology and those course subjects. Integrate carefully the material offered in those lectures so that it blends with the information and field covered by the instructor in forestry. Plan, by the timing of the lectures and careful selection of material, to emphasize the point and create the picture of the close interrelation which actually exists between the two subjects. In this way the subject of forest entomology in relation to silviculture could be taught advantageously as a part of the course of silviculture, and forest entomology in forest management as a part of a course on that subject. Insects in forest ecology could be taught in an ecology course, and insect-caused defects in timber might be worked into one or the courses on the properties of wood or utilization of products. Other close relationships could be found and developed.

The advantages of having some of the forest entomology taught in this manner are several. First, it would clear a considerable portion of the time available in one course on forest entomology for use in presenting introductory or fundamental entomology. Secondly, it would more adequately present to the students the picture of how forest entomology relates to forestry. Thirdly, it would benefit the forest instructor because he would have at his call the services of an expert to present one phase of his subject which otherwise might be slighted, if treated at all. In the fourth place, it would benefit the instructor in entomology, as he would have close contact with forestry and would more fully appreciate that the union of forestry and entomology in the title of his subject matter is actual and not merely descriptive. If there is not time for two courses in entomology for forestry students, I would recommend consideration of the above arrangement. Even if there is time for two courses, it appears to me that this method of presenting the material on the relations of forestry and forest entomology has much to recommend its use. It is not enough that we merely furnish the forester with a tool for his use. We must also show him where and how he can use it in a way that will suggest to him how to get full value from it in the practice of his profession.

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